We claim:

1. A method of signal transmission comprising the steps of:

splitting a signal s_1 into signals $s_1(a)$ and $s_1(b)$, wherein signal s_1 comprises a first STS/OTD signal belonging to an STS/OTD pair;

splitting a signal s_2 into signals $s_2(a)$ and $s_2(b)$, wherein signal s_2 comprises a second STS/OTD signal belonging to the STS/OTD pair;

phase sweeping the signal $s_1(b)$ using a first phase sweep frequency signal to produce a phase swept signal $s_1(b)$;

phase sweeping the signal $s_2(b)$ using a second phase sweep frequency signal to produce a phase swept signal $s_2(b)$, the first and second phase sweep frequency signals being configured to cancel out any self induced interference caused by phase sweeping the signals $s_1(b)$ and $s_2(b)$;

adding the phase swept signal $s_2(b)$ to the signal $s_1(a)$ to produce a summed signal s_3; and

adding the phase swept signal $s_1(b)$ to the signal $s_2(a)$ to produce a summed signal s_4.

2. The method of claim 1, wherein the first and second phase sweep frequency signals utilize a same phase sweep frequency with the second phase sweep frequency signal rotating in the opposite direction plus an offset of π relative to the first phase sweep frequency signal.

3. The method of claim 1, wherein the first and second phase sweep frequency signals utilize a same phase sweep frequency with the first phase sweep frequency signal rotating in the opposite direction plus an offset of π relative to the second phase sweep frequency signal.

4. The method of claim 1 comprising the additional steps of:

amplifying the summed signal s_3 to produce an amplified summed signal s_3; and

amplifying the summed signal s_4 to produce an amplified summed signal s_4.

5. The method of claim 1 comprising the additional steps of:

transmitting the summed signal s_3 over a first antenna belonging to a pair of diversity antennas; and

transmitting the summed signal s_4 over a second antenna belonging to the pair of diversity antennas.

6. The method of claim 1 comprising the additional steps of:

prior to the step of adding the phase swept signal $s_2(b)$ to the signal $s_1(a)$, phase sweeping the signal $s_1(a)$ using a third phase sweep frequency signal to produce a phase swept signal $s_1(a)$ with a different phase from the phase swept signal $s_2(b)$; and

prior to the step of adding the phase swept signal $s_1(b)$ to the signal $s_2(a)$, phase sweeping the signal $s_2(a)$ using a fourth phase sweep frequency signal to produce a phase swept signal $s_2(a)$ with a different phase from the phase swept signal $s_1(b)$.

7. A method of signal transmission comprising the steps of:

splitting a signal s_1 into signals $s_1(a)$ and $s_1(b)$, wherein signal s_1 comprises a first STS/OTD signal belonging to an STS/OTD pair;

splitting a signal s_2 into signals $s_2(a)$ and $s_2(b)$, wherein signal s_2 comprises a second STS/OTD signal belonging to the STS/OTD pair;

phase sweeping the signal $s_1(a)$ using a first phase sweep frequency signal to produce a phase swept signal $s_1(a)$;

phase sweeping the signal $s_2(a)$ using a second phase sweep frequency signal to produce a phase swept signal $s_2(a)$, the first and second phase sweep frequency signals being configured to cancel out any self induced interference caused by phase sweeping the signals $s_1(a)$ and $s_2(a)$;

adding the phase swept signal $s_2(a)$ to the signal $s_1(b)$ to produce a summed signal s_3; and

adding the phase swept signal $s_1(a)$ to the signal $s_2(b)$ to produce a summed signal s_4.

8. The method of claim 7, wherein the first and second phase sweep frequency signals utilize a same phase sweep frequency with the second phase sweep frequency signal rotating in the opposite direction plus an offset of π relative to the first phase sweep frequency signal.

9. The method of claim 7, wherein the first and second phase sweep frequency signals utilize a same phase sweep frequency with the first phase sweep frequency signal rotating

in the opposite direction plus an offset of π relative to the second phase sweep frequency signal.

10. The method of claim 7 comprising the additional steps of:

amplifying the summed signal s_3 to produce an amplified summed signal s_3; and

amplifying the summed signal s_4 to produce an amplified summed signal s_4.

11. The method of claim 7 comprising the additional steps of:

transmitting the summed signal s_3 over a first antenna belonging to a pair of diversity antennas; and

transmitting the summed signal s_4 over a second antenna belonging to the pair of diversity antennas.

12. The method of claim 7 comprising the additional steps of:

prior to the step of adding the phase swept signal $s_2(a)$ to the signal $s_1(b)$, phase sweeping the signal $s_1(b)$ using a third phase sweep frequency signal to produce a phase swept signal $s_1(b)$ with a different phase from the phase swept signal $s_2(a)$; and

prior to the step of adding the phase swept signal $s_1(a)$ to the signal $s_2(b)$, phase sweeping the signal $s_2(b)$ using a fourth phase sweep frequency signal to produce a phase swept signal $s_2(b)$ with a different phase from the phase swept signal $s_1(a)$.

13. A base station comprising:

a first splitter for splitting a signal s_1 into signals $s_1(a)$ and $s_1(b)$, wherein signal s_1 comprises a first STS/OTD signal belonging to an STS/OTD pair;

a second splitter for splitting a signal s_2 into signals $s_2(a)$ and $s_2(b)$, wherein signal s_2 comprises a second STS/OTD signal belonging to the STS/OTD pair;

a first multiplier for phase sweeping the signal $s_1(b)$ using a first phase sweep frequency signal to produce a phase swept signal $s_1(b)$;

a second multiplier for phase sweeping the signal $s_2(b)$ using a second phase sweep frequency signal to produce a phase swept signal $s_2(b)$, the first and second phase sweep frequency signals being configured to cancel out any self induced interference caused by phase sweeping the signals $s_1(b)$ and $s_2(b)$;

a first adder for adding the phase swept signal $s_2(b)$ to the signal $s_1(a)$ to produce a summed signal s_3; and

a second adder for adding the phase swept signal $s_1(b)$ to the signal $s_2(a)$ to produce a summed signal s_4.

14. The base station of claim 13, wherein the first and second phase sweep frequency signals utilize a same phase sweep frequency with the second phase sweep frequency signal rotating in the opposite direction plus an offset of π relative to the first phase sweep frequency signal.

15. The base station of claim 13, wherein the first and second phase sweep frequency signals utilize a same phase sweep frequency with the first phase sweep frequency signal rotating in the opposite direction plus an offset of π relative to the second phase sweep frequency signal.

16. The base station of claim 13 further comprising:

a first amplifier for amplifying the summed signal s_3 to produce an amplified summed signal s_3; and

a second amplifier for amplifying the summed signal s_4 to produce an amplified summed signal s_4.

17. The base station of claim 13 further comprising:

a pair of diversity antennas having a first and a second antenna;

a first transmitter for transmitting the summed signal s_3 over the first antenna; and

a second transmitter for transmitting the summed signal s_4 over the second antenna.

18. The base station of claim 13 further comprising:

a third multiplier for phase sweeping the signal $s_1(a)$ using a third phase sweep frequency signal to produce a phase swept signal $s_1(a)$ with a different phase from the phase swept signal $s_2(b)$ prior to adding the phase swept signal $s_2(b)$ to the signal $s_1(a)$; and

a fourth multiplier for phase sweeping the signal $s_2(a)$ using a fourth phase sweep frequency signal to produce a phase swept signal $s_2(a)$ with a different phase from the phase swept signal $s_1(b)$ prior to adding the phase swept signal $s_1(b)$ to the signal $s_2(a)$.

19. A base station comprising:

a first splitter for splitting a signal s_1 into signals $s_1(a)$ and $s_1(b)$, wherein signal s_1 comprises a first STS/OTD signal belonging to an STS/OTD pair;

a second splitter for splitting a signal s_2 into signals $s_2(a)$ and $s_2(b)$, wherein signal s_2 comprises a second STS/OTD signal belonging to the STS/OTD pair;

a first multiplier for phase sweeping the signal $s_1(a)$ using a first phase sweep frequency signal to produce a phase swept signal $s_1(a)$;

a second multiplier for phase sweeping the signal $s_2(a)$ using a second phase sweep frequency signal to produce a phase swept signal $s_2(a)$, the first and second phase sweep frequency signals being configured to cancel out any self induced interference caused by phase sweeping the signals $s_1(a)$ and $s_2(a)$;

a first adder for adding the phase swept signal $s_2(a)$ to the signal $s_1(b)$ to produce a summed signal s_3; and

a second adder for adding the phase swept signal $s_1(a)$ to the signal $s_2(b)$ to produce a summed signal s_4.

20. The base station of claim 19, wherein the first and second phase sweep frequency signals utilize a same phase sweep frequency with the second phase sweep frequency signal rotating in the opposite direction plus an offset of π relative to the first phase sweep frequency signal.

21. The base station of claim 19, wherein the first and second phase sweep frequency signals utilize a same phase sweep frequency with the first phase sweep frequency signal rotating in the opposite direction plus an offset of π relative to the second phase sweep frequency signal.

22. The base station of claim 19 further comprising:

a first amplifier for amplifying the summed signal s_3 to produce an amplified summed signal s_3; and

a second amplifier for amplifying the summed signal s_4 to produce an amplified summed signal s_4.

23. The base station of claim 19 further comprising:

a pair of diversity antennas having a first and a second antenna;

a first transmitter for transmitting the summed signal s_3 over the first antenna; and

a second transmitter for transmitting the summed signal s_4 over the second antenna.

24. The base station of claim 19 further comprising:

a third multiplier for phase sweeping the signal $s_1(b)$ using a third phase sweep frequency signal to produce a phase swept signal $s_1(b)$ with a different phase from the phase swept signal $s_2(a)$ prior to adding the phase swept signal $s_2(a)$ to the signal $s_1(b)$; and

a fourth multiplier for phase sweeping the signal $s_2(b)$ using a fourth phase sweep frequency signal to produce a phase swept signal $s_2(b)$ with a different phase from the phase swept signal $s_1(a)$ prior to adding the phase swept signal $s_1(a)$ to the signal $s_2(b)$.